

CLAIMS

1. A wireless local loop system comprising:
- a data network/PSTN gateway unit;
 - at least one data lines;
 - at least one base stations connected to the gateway unit via said at least one data lines respectively;

a multiplicity of wireless subscriber units communicating wirelessly with the base station, each wireless subscriber unit comprising at least one interfaces to at least one host including a telephone host, each subscriber unit comprising:

an analog converter operative to translate incoming information in IP packet format into analog voice representation and to feed said analog voice representation to the telephone host, and to receive incoming analog voice information from the telephone host, to translate said incoming analog voice information into IP packet formatted information and to feed said IP packet formatted information to the base station; and

a packet switcher operative to perform packet switching on IP packets arriving from the base station connected to the subscriber unit, including routing IP packets for hosts other than the telephone host to those hosts and routing IP packets for the telephone host to the analog converter;

and wherein said base station is operative to perform packet switching on incoming IP packets based on an IP destination address included in each said incoming IP packet;

and wherein said gateway unit is operative to switch incoming data packets onto the data network, to translate incoming voice packets from IP packet format into analog voice representation and to switch said analog voice representation onto the PSTN.

2. A system according to claim 1 wherein each host comprises one of the following group of host types:

- a telephone;
- a telefax;

a computer;
a data modem; and
a cable modem.

3. A system according to claim 1 wherein said at least one data lines comprise wired data lines.

4. A system according to claim 1 wherein the data network comprises the Internet.

5. A wireless local loop method comprising:

providing a data network/PSTN gateway unit, at least one data lines, at least one base stations connected to the gateway unit via said at least one data lines respectively and a multiplicity of wireless subscriber units communicating wirelessly with the base station, each wireless subscriber unit comprising at least one interface to at least one host including a telephone host, translating incoming information in IP packet format into analog voice representation and feeding said analog voice representation to the telephone host, receiving incoming analog voice information from the telephone host, translating said incoming analog voice information into IP packet formatted information and feeding said IP packet formatted information to the base station; and

performing packet switching on IP packets arriving from the base station connected to the subscriber unit, including routing IP packets for hosts other than the telephone host to those hosts and routing IP packets for the telephone host to the analog converter;

and wherein said base station is operative to perform packet switching on incoming IP packets based on an IP destination address included in each said incoming IP packet;

and wherein said gateway unit is operative to switch incoming data packets onto the data network, to translate incoming voice packets from IP packet format into analog voice representation and to switch said analog voice representation onto the PSTN.

6. A quality of service system including:
 - a congestion avoidance subunit; and
 - a traffic flow control unit.
7. Quality of service server apparatus comprising:
 - a protocol detector; and
 - a connection layer analyzer comprising:
 - a UDP analyzer;
 - a TCP analyzer; and
 - an ICMP analyzer.
8. Server apparatus according to claim 7 wherein the UDP analyzer comprises a rate controlled UDP analyzer.
9. Server apparatus according to claim 7 wherein the TCP analyzer comprises a rate controlled TCP analyzer.
10. Apparatus according to claim 7 wherein the UDP analyzer is operative to perform at least some of the following steps:
 - identify application by using its port number;
 - check whether packet belongs to already open session by comparing port numbers and session's participant's IP addresses;
 - if it is an open session, stamp packet with TTL from applications lookup table;
 - if it is a new session, consult with policy agent to determine whether this session is allowed to initiate;
 - inform MAC on application's covenant, in terms of CS air MAC-address;
 - and
 - inform MAC about session end events.

11. Apparatus according to claim 7 wherein the TCP analyzer performs at least some of the following reliability checks:

- acknowledges receipt of packets;
- retransmits when dropped packets are detected;
- re-sequences segments, if necessary, if they arrive out of order;
- tosses packets if data became corrupt during transmission;
- discards duplicate segments; and
- maintains flow control to manage a connection's transmission rate.

12. A system according to claim 6 wherein the congestion avoidance unit is operative to perform classified queuing.

13. A system according to claim 6 wherein the rate of TCP transmissions is at least partly controlled by detecting real-time flow speed and then delaying ACKs going back to the transmitter.

14. A system according to claim 6 wherein the rate of TCP transmissions is at least partly controlled by modifying the advertised window size in the packets sent to the transmitter.

15. A system according to claim 12 wherein the classified queuing performed by the congestion avoidance unit comprises assigning packets, arriving with a time-to-live stamp to the transmit-queue cluster, to a queue according to their time-to-live indicator.

16. A quality of service system comprising:

- an adaptive network filtration and forwarding agent;
- a quality of service server; and
- a classified queuing mechanism.

17. A system according to claim 16 wherein said agent is operative to forward packets that belong to the wireless channel only while filtering out irrelevant data streams and competing over the air channel.

18. A system according to claim 16 wherein the quality of service server is operative to execute network and application layers policies including executing at least one of the following: analyzing each incoming packet to detect its session, evaluating channel load, performing flow control operations such as delaying packets and intervening into the connection layer, and attaching a quality of service header to the packet describing the packet's boundary conditions.

19. A system according to any of the preceding claims wherein rate control is carried out such that queues within the access system are kept at substantially a constant length, thereby to reduce session jitter.

20. A system according to claim 16 wherein the classified queuing mechanism provides TTL adaptive access latency within the MAC domain, thereby to enable improved channel bandwidth control for queued data regimes.